

WHAT IS CLAIMED IS:

1. A system for detecting and suppressing a fire condition in a storage unit, the system comprising:

a transmitter associated with the storage unit and configured to transmit a first signal upon detection of the fire condition;

at least one receiver configured to detect the first signal and configured to provide a second signal indicating detection of the fire condition; and

a fire suppression device configured to discharge a fire suppressant material into the storage unit upon detection of the fire condition.

2. A system according to claim 1, wherein there are a plurality of storage units, a plurality of transmitters, and a plurality of receivers, and wherein an individual transmitter and an individual receiver are associated with each of the plurality of storage units.

3. A system according to claim 1, wherein each of the storage units is located at a predetermined position relative to the individual receiver associated with the storage unit.

4. A system according to claim 3, wherein the second signal from a receiver is provided to a control panel that in response to the second signal identifies the storage unit experiencing the fire condition.

5. A system according to claim 2, wherein at least some of the storage units are containers.

6. A system according to claim 2, wherein at least some of the storage units are pallets.

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7. A system according to claim 1, wherein the fire suppression device comprises a pressurized vessel located within the storage unit, the vessel containing the fire suppressant material within the vessel; and

a fire detection component that activates the discharge of the fire suppressant material into the storage unit upon detection of a fire condition.

8. A system according to claim 1, wherein the first signal is an infrared signal.

9. A system according to claim 1, wherein the transmitter includes a bimetallic switch configured to close upon detection of the fire condition.

10. A system according to claim 9, wherein the bimetallic switch is in contact with a surface of the storage unit.

11. A system according to claim 9, wherein the bimetallic switch extends through a surface of the storage unit.

12. A system according to claim 11, wherein the surface is a cover for the storage unit.

13. A system according to claim 11, wherein the surface is a fire resistant blanket.

14. A system according to claim 2, where the fire suppression device includes a source of pressurized fire suppressant material and a popup device disposed between one of the storage units and the source, the popup device being configured to apply the fire suppressant material to the storage unit upon detection of the fire condition.

15. A system according to claim 14, wherein a storage unit is a container with a base including a hole, and the popup device includes a valve aligned with the hole, such that the fire suppressant material is discharged into the container through the hole in the base.

16. A system according to claim 14, further comprising a control unit configured to detect the second signal and transmit an activation signal to the popup device upon detecting the second signal.

17. A system according to claim 16, further comprising a control panel having a warning indicator, wherein the control unit transmits an alert signal to the warning indicator on the panel.

18. A fire suppression and indication system for use in an aircraft, the aircraft having a cockpit, a control panel in the cockpit, and a storage area, the system comprising:

a plurality of storage units located at predetermined positions in the storage area;

a transmitter associated with each storage unit and configured to transmit a first signal upon detection of the fire condition;

at least one receiver configured to detect the first signal and configured to provide a second signal indication detection of the fire condition; and

a fire suppression device configured to discharge a fire suppressant material into the storage unit upon detection of the fire condition.

19. A system according to claim 18, wherein the fire suppression device includes a source of pressurized fire suppressant material and an application

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mechanism associated with one of the predetermined positions, the application mechanism is arranged between one of the storage units and the source and configured to apply the fire suppression device to the storage unit upon detection of the fire condition.

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20. A system according to claim 19, wherein at least one of the storage unit is a container with a base including a hole, and the application mechanism includes a valve aligned with the hole, such that the fire suppressant material is discharged into the container through the hole in the base.

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21. A system according to claim 20, wherein the valve is in a retracted position prior to detection of the fire condition, and the valve is configured to engage the base of the container upon detection of the fire condition.

22. A system according to claim 21, wherein the application mechanism includes a piston to move the valve into contact with the base.

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23. A system according to claim 18, wherein the storage unit is a pallet including a fire resistant blanket, and the fire suppression device is arranged below the fire resistant blanket.

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24. A system according to claim 18, further comprising a control unit configured to receive the second signal and the control unit is configured to determine the origin of the first signal based on the second signal.

25. A system according to claim 24, wherein the control unit transmits a third signal to a control panel indicating the origin of the first signal.

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26. A system according to claim 25, wherein the control unit transmits a fourth signal to the fire suppression device to discharge the fire suppressant material into the container.

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27. A system according to claim 18, wherein the first signal is an infrared signal.

28. A fire detection and suppression device comprising:
a pressurized vessel having an opening;
a fire suppressant material contained within the vessel;
a discharge tube having a first end connected to the opening of the vessel and a second end distal from the vessel, the tube having at least one aperture allowing discharge of the fire suppressant material;
a seal arranged in the discharge tube between the aperture and the opening prior to discharging of the fire suppressant material; and
a fire detection component arranged in the discharge tube, the fire detection component activating the discharge of the fire suppressant material upon detection of a fire condition.

29. A device according to claim 28, wherein the fire detection component includes a fuse plug disposed in the discharge tube; and

a rod having a first end in contact with the fuse plug and second end in contact with the seal,

wherein the fuse plug melts upon reaching a predetermined temperature and the rod and the seal are displaceable upon melting of the fuse plug.

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30. A device according to claim 29, wherein the discharge tube is a hollow cylinder.

31. A device according to claim 30, further comprising a guide located within the discharge tube such that the rod extends through the guide.

32. A device according to claim 29, including a vent to permit direct heat transfer from the atmosphere around the device to the fuse plug.

33. A device according to claim 29, wherein the discharge tube includes a plurality of bores located circumferentially about the second end to allow air to contact the fuse plug.

34. A fire suppression and indication system, the system comprising:
a pressurized vessel having an opening;
a fire suppressant material contained within the vessel;
a discharge tube having a first end connected to the opening of the vessel and a second end distal from the vessel, the tube having at least one aperture allowing discharge of the fire suppressant material;
a seal arranged in the discharge tube between the aperture and the opening prior to discharging of the fire suppressant material;
a fire detection component arranged in the discharge tube, the fire detection component activating the discharge of the fire suppressant material upon detection of a fire condition; and
a transmitter that detects the discharge of the fire suppressant material and transmits a signal indicating a fire condition.

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35. A system according to claim 34, wherein the fire detection component includes a fuse plug disposed in the discharge tube; and

a rod having a first end in contact with the fuse plug and second end in contact with the seal,

wherein the fuse plug melts upon reaching a predetermined temperature and the rod and the seal are displaced upon melting of the fuse plug.

36. A system according to claim 35, further comprising a magnet located on the rod and the transmitter includes a switch capable of detecting the magnet, whereby detection of the magnet activates the transmitter.

37. A system according to claim 34, wherein the transmitter includes a pressure sensor switch that measures the pressure in the pressure vessel and detects the discharge of the fire suppressant material.

38. A system according to claim 34, wherein the signal is an infrared signal.

39. A system according to claim 34, further comprising:

a control panel; and

a receiver that detects the signal from the transmitter and sends a second signal to the control panel.

40. A system according to claim 39, wherein the control panel includes a warning indicator.

41. A fire suppression and indication system for use in an aircraft, the aircraft having a cockpit, a control panel in the cockpit, and a storage area, the system comprising:

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a plurality of containers in the storage area, wherein each container includes a base and a cover having an opening;

a fire suppression device located inside each of the containers, the fire suppression device comprising

a vessel;

a fire suppressant material inside the vessel;

a discharge tube attached to the vessel;

a fire detection system that detects a fire condition and activates the discharge of fire suppression material through the discharge tube; and

a transmitter that emits a first signal through the opening when the fire detection system releases the fire suppressant material.

42. A system according to claim 41, further comprising a receiver located above each of the containers, each of the receivers being configured to detect the first signal and provide a second signal to the control panel of the aircraft indicating the release of the fire suppressant material.

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